(19) Japanese Patent Office (JP)
Public Patent Disclosure Bulletin
(11) Public Patent Disclosure (Kokai) Number: **S53-131357**
(43) Unexamined Patent Application Date: November 16, 1978
(51) Int. Cl. ^{2} : F 16 B 5/06
(52) Japanese Classification 53 E 21
Identification Symbols:
File Numbers: 6361-31
Number of Claims: 5
Examination Requests: None
(Total of 4 Original Pages)

(54) Title of the Invention: **Film Plate Folding-Over Seal and Sealing Device**

(21) Application Number: S52-47760
(22) Application Date: April 25, 1977
(72) Inventor: Marti Continen, Oiasente 16A12, Helsinki, Finland
(71) Applicant: Marti Continen, Oiasente 16A12, Helsinki, Finland
(74) Representative: Attorney Kaoru Masui

Specification

1. Title of the Invention

Film Plate Folding-Over Seal and Sealing Device

2. Claims

1. A film plate folding-over seal in which film plates (1 and 2) that are folded over around a support rod (3) are held to said support rod by a grooved rod (4 or 6), characterized by the fact that the film plates (1 and 2) are held together at the two groove ends (5 or 7) of a grooved rod (4 or 6) that has a cross-section in the form of a cut-off circle.
2. A seal as in claim 1 where the two groove ends (7) of the grooved rod (6) are bent inward.
3. A sealing device for making the seal of claim 1 or claim 2, equipped with guide jaws (16 and 17, or 21 and 22) that guide the support rod (3 or 24), and said jaws move together with said support rod and form guide grooves in a closed state together with guide jaws (10 and 11, or 25 and 26) around the grooved rod (4 or 28), and the support rod and the film plates pass into the grooved rod via said guide grooves.
4. A device as in claim 3 provided with claws (14) that spread apart the groove ends of said grooved rod within the guide jaws (10 and 11) that surround the grooved rod (4) and form part of the guide grooves.
5. A device as in claim 3 provided with guide jaws (25 and 26) that surround the grooved rod (28) and form part of the guide grooves, and that are in the same state as guide jaws (21 and 22) that surround the support rod (24).

3. Detailed Description of the Invention

The present invention relates to a folding-over seal of elastic film plates, especially film plates made of plastic, and a sealing device for making it.

A folding-over seal has film plates that are joined and folded over around a hard object, that is, a support rod, and held together by a grooved rod. Traditionally, for this type of seal, the sealing force mainly depends on a compression force between the support rod and the grooved rod, and that has the disadvantage that in order to form a seal the lengths of the pieces that form the seal must be precise.

In order to eliminate this disadvantage and optimize the commercial production of the seal, the present invention is a film plate folding-over seal in which film plates that are folded over around a support rod are held to this support rod by a grooved rod, such that the film plates are held at the two groove ends of a grooved rod that has a cross-section in the form of a cut-off circle.

Also, to best apply this seal in rapid commercial production, the present invention is also a sealing device characterized by the fact that the abovementioned guide jaws are arranged in pairs that slide freely on stands that move toward each other so that the support rod and the film plates together pass into the grooved rod via guide grooves that are formed in a closed state by the guide jaws around the support rod and the guide jaws around the grooved rod.

According to the example of practical application shown in figure 1, in a seal of the present invention, plastic film plates (1, 2) around a support rod (3) are held by a grooved rod (4) around the support rod, where the film plates are sandwiched between the two groove ends (5) of the grooved rod.

In another example of practical application of a seal of the present invention as shown in figure 2, the two groove ends (7) of the grooved rod (6) are bent inward to form a flange. This strengthens the seal and is also an advantage for production technology.

Figure 3 shows an example of practical application of a sealing device of the present invention, where this device has guide jaws (16 and 17) and a pushing jaw (8). The pushing jaw (8) is attached to a stand (9) that is moved by an air cylinder on a horizontal guide, and the guide jaws (16 and 17) are attached on both sides of the pushing jaw (8). When the guide jaws (16 and 17) are not moving, their front ends form a space into which the support rod (3) fits. The support rod is provided from a special providing device and is cut to an appropriate length. The supplying and cutting devices are attached to the sealing device but their explanations are omitted.

Jaws (10 and 11) that surround the grooved rod (4) on the other side of the film plates (1 and 2) to be sealed attach to axles (12) on another stand (13). The stand (13) slides along a guide, the same as the stand (9). Claws (14) that face inward are provided on the front ends of the jaws (10 and 11) and are used to push the groove ends of the grooved rod outward. The two jaws can be spread apart by an axle (15), and the axle (15) separates the two jaws by sliding along a sloped surface (18).

The following is how a seal of the present invention is made. When the stands (9 and 13) are not moving, the support rod and the grooved rod, which have previously been cut to appropriate lengths, fit into spaces at the front ends of the jaws (16 and 17) and the jaws (10 and 11), respectively. The film plates that are to be joined and sealed are positioned midway between the jaws on both sides. The stands (9 and 13) are moved toward each other by air cylinders. The spreading axle (15) remains still until the jaws (16 and 17, and 10 and 11) meet, and then as the stands continue to move it slides along the sloped surface (18) to spread apart the jaws (10, 11). At this time the jaws (16 and 17) join with the jaws (10 and 11) to form guide grooves that are mostly closed. Via these guide grooves, the support rod and the film plates that are around it are inserted into the grooved rod.

As this operation continues further, the pushing jaw (8) pushes the grooved rod to separate it from the claws (4), and the grooved rod, due to its elasticity, is compresed so that the seal does not open. In this way, when the jaws (10 and 11) open, the finished seal is released from the sealing device.

In the modified form of the device of the present invention shown in figures 5 and 6, pushing jaws (23 and 27) that are equipped with guide jaws (21 and 22, and 25 and 26) are attached to stands (19 and 20) that move on horizontal guides. The stands (19 and 20) are moved by air cylinders toward each other and are returned by a spring (29). The guide jaws have springs that promote this.

In this modified form, when the stands (19 and 20) are not moving, the support rod (24) and grooved rod (28) are positioned in spaces at the ends of each pair of guide jaws on both sides, and the film plates that are to be sealed are positioned midway between the guide jaws on both sides. When the stands (19 and 20) move toward each other, the guide jaws facing each other on both sides come into contact to form closed guide grooves, and the support rod and the film plates that are around it are inserted into the grooved rod. This sealing device uses the grooved rod of figure 2 where the groove ends bend inward. When the movement that provides the force that pushes the guide jaws together is complete, the stands return and the completed seal is released from the sealing device.

The present invention is not limited to the practical examples of application that have been described above. For example, in the sealing device, parts of the guide jaws may be fixed and other parts attached to the guide, or the guide jaws in their entirety may be fixed and their front end portions made from an elastic material.

4. Brief Explanation of the Figures

The figures show practical examples of application of the seal and the sealing device of the present invention. Figures 1 and 2 are cross-sections of a seal and a modification of it. Figures 3 through 6 are explanatory figures that show a sealing device and a modification of it, in states when they are not moving and when the guide jaws are in contact.

1, 2……film plates, 3, 24……support rods, 4, 6, 28……grooved rods, 5, 7……groove ends, 8, 23, 27……pushing jaws, 9, 13, 19, 20……stands, 10, 11, 16, 17, 21, 22, 25, 26……guide jaws, 14……claws, 15……speading axle, 29……spring between stands on a guide.

Patent Applicant Marti Kontinen
Representative Attorney Kaoru Masui [stamp]

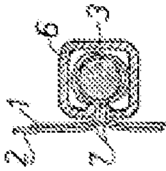

FIG. 2

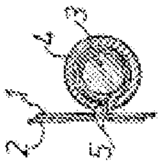

FIG. 1

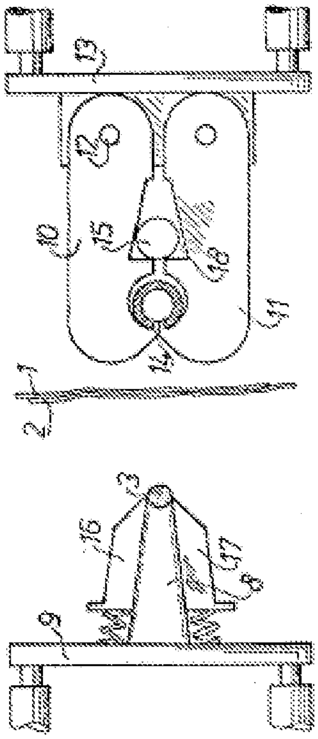

FIG. 3

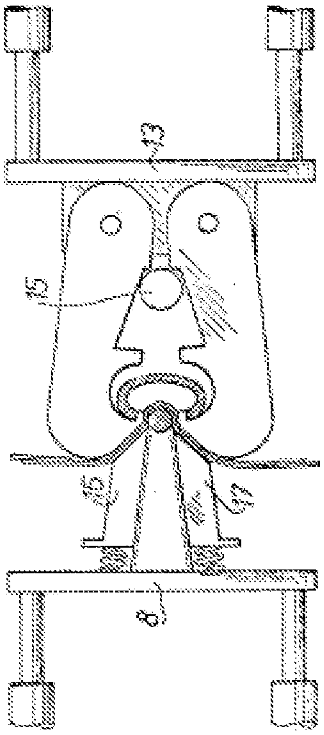

FIG. 4

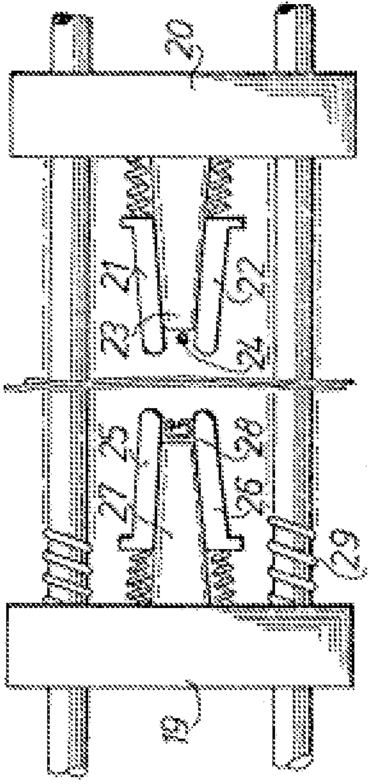

FIG. 5

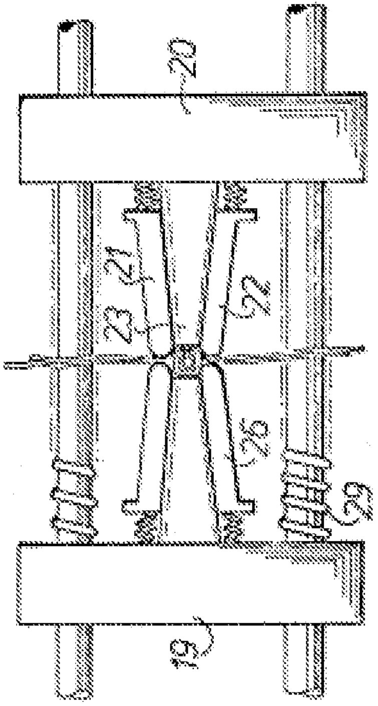

FIG. 6